

## Claims

What is claimed is:

1. Seed of maize inbred line designated PH51H, representative seed of said line having been deposited under ATCC Accession No. \_\_\_\_\_.
2. A maize plant, or parts thereof, produced by growing the seed of claim 1.
3. The maize plant of claim 2, wherein said plant is male sterile.
4. A tissue culture of regenerable cells from the plant of claim 2.
5. A tissue culture according to claim 4, the cells or protoplasts being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.
6. A maize plant regenerated from the tissue culture of claim 4, capable of expressing all the morphological and physiological characteristics of inbred line PH51H, representative seed of which have been deposited under ATCC Accession No. \_\_\_\_\_.
7. A method for producing a first generation (F<sub>1</sub>) hybrid maize seed comprising crossing the plant of claim 2 with a different inbred parent maize plant and harvesting the resultant first generation (F<sub>1</sub>) hybrid maize seed.
8. The method of claim 7 wherein the inbred maize plant of claim 2 is the female or male parent.
9. An F<sub>1</sub> hybrid seed produced by crossing the inbred maize plant according to claim 2 with another, different maize plant.
10. An F<sub>1</sub> hybrid plant, or parts thereof, grown from the seed of claim 9.
11. The maize plant, or parts thereof, of claim 2, wherein the plant or parts thereof have been transformed so that its genetic material contains one or more transgenes operably linked to one or more regulatory elements.
12. A method for producing a maize plant that contains in its genetic material one or more transgenes, comprising crossing the maize plant of claim 11 with either a second plant of another maize line, or a non-transformed maize plant of the line PH51H, so that the genetic material of the progeny that result from the cross contains the transgene(s) operably linked to a regulatory element.
13. Maize plants, or parts thereof, produced by the method of claim 12.
14. A maize plant, or parts thereof, wherein at least one ancestor of said maize plant is the maize plant of claim 2, said maize plant expressing a combination of at least two PH51H traits selected from the group consisting of: a relative maturity of approximately 94-100 based on the Comparative Relative Maturity Rating System for

harvest moisture of grain, very high female yield, very high scatter grain resistance, a small tassel, above average pollen shed, high hybrid yield with very fast drydown, heat and seasonal drought tolerance, excellent late season plant health, above average stalk lodging resistance, above average test weight, above average grain quality, a short plant, low ear placement, strong overall agronomic standability, and adapted to the Northwest, Northcentral, and Northeast regions of the United States, Northern and Central Europe and Canada.

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15. A method for developing a maize plant in a maize plant breeding program using plant breeding techniques, which include employing a maize plant, or its parts, as a source of plant breeding material, comprising: obtaining the maize plant, or its parts, of claim 2 as a source of said breeding material.

16. The maize plant breeding program of claim 15 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

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17. A maize plant, or parts thereof, produced by the method of claim 15.

18. The maize plants, or parts thereof, of claim 2, further comprising one or more single gene conversions.

19. The single gene conversion(s) of claim 18, wherein the gene is a dominant allele.

20. The single gene conversion(s) of claim 18, wherein the gene is a recessive allele.

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21. A maize plant, or parts thereof, having all the physiological and morphological characteristics of inbred line PH51H, representative seed of said line having been deposited under ATCC accession No. \_\_\_\_\_.

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22. The maize plant of claim 21, wherein said plant is male sterile.

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23. A tissue culture of regenerable cells from the plant of claim 21.

24. A tissue culture according to claim 23, the cells or protoplasts being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

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25. A maize plant regenerated from the tissue culture of claim 23, capable of expressing all the morphological and physiological characteristics of inbred line PH51H, representative seed of which have been deposited under ATCC Accession No. \_\_\_\_\_.

26. A method for producing a first generation (F<sub>1</sub>) hybrid maize seed comprising crossing the plant of claim 21 with a different inbred parent maize plant and harvesting the resultant first generation (F<sub>1</sub>) hybrid maize seed.

*sub 17* 27. The method of claim 26 wherein the inbred maize plant of claim 21 is the female or male parent.

*check* 28. An F<sub>1</sub> hybrid seed produced by crossing the inbred maize plant according to claim 21 with another, different maize plant.

29. An F<sub>1</sub> hybrid plant, or parts thereof, grown from the seed of claim 28.

*sub 30* 30. The maize plant, or parts thereof, of claim 21, wherein the plant or parts thereof have been transformed so that its genetic material contains one or more transgenes operably linked to one or more regulatory elements.

31. A method for producing a maize plant that contains in its genetic material one or more transgenes, comprising crossing the maize plant of claim 30 with either a second plant of another maize line, or a non-transformed maize plant of the line PH51H, so that the genetic material of the progeny that result from the cross contains the transgene(s) operably linked to a regulatory element.

*sub 32* 32. Maize plants or parts thereof, produced by the method of claim 31.

*sub 33* 33. A maize plant, or parts thereof, wherein at least one ancestor of said maize plant is the maize plant of claim 21, said maize plant expressing a combination of at least two PH51H traits selected from the group consisting of: a relative maturity of approximately 94-100 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, very high female yield, very high scatter grain resistance, a small tassel, above average pollen shed, high hybrid yield with very fast drydown, heat and seasonal drought tolerance, excellent late season plant health, above average stalk lodging resistance, above average test weight, above average grain quality, a short plant, low ear placement, strong overall agronomic standability, and adapted to the Northwest, Northcentral, and Northeast regions of the United States, Northern and Central Europe and Canada.

34. A method for developing a maize plant in a maize plant breeding program using plant breeding techniques, which include employing a maize plant, or its parts, as a source of plant breeding material, comprising: obtaining the maize plant, or its parts, of claim 21 as a source of said breeding material.

35. The maize plant breeding program of claim 34 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing,

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42. The method of claim 40, further comprising:

- (c) crossing said PH51H-derived maize plant with itself or another maize plant to yield additional PH51H-derived progeny maize seed;
- (d) growing said progeny maize seed of step (c) under plant growth conditions, to yield additional PH51H-derived maize plants;
- (e) repeating the crossing and growing steps of (c) and (d) from 0 to 5 times to generate further PH51H-derived maize plants.

43. A further derived maize plant, or parts thereof, produced by the method of claim 42.

44. The method of claim 40, still further comprising utilizing plant tissue culture methods to derive progeny of said PH51H-derived maize plant.

45. A PH51H-derived maize plant, or parts thereof, produced by the method of claim 44, said PH51H-derived maize plant expressing a combination of at least two PH51H traits selected from the group consisting of: a relative maturity of approximately 94-100 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, very high female yield, very high scatter grain resistance, a small tassel, above average pollen shed, high hybrid yield with very fast drydown, heat and seasonal drought tolerance, excellent late season plant health, above average stalk lodging resistance, above average test weight, above average grain quality, a short plant, low ear placement, strong overall agronomic standability, and adapted to the Northwest, Northcentral, and Northeast regions of the United States, Northern and Central Europe and Canada.

46. The further PH51H-derived maize plant, or parts thereof, of claim 43, wherein said further PH51H-derived maize plant, or parts thereof, express a combination of at least two PH51H traits selected from the group consisting of: a relative maturity of approximately 94-100 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, very high female yield, very high scatter grain resistance, a small tassel, above average pollen shed, high hybrid yield with very fast drydown, heat and seasonal drought tolerance, excellent late season plant health, above average stalk lodging resistance, above average test weight, above average grain quality, a short plant, low ear placement, strong overall agronomic standability, and adapted to the Northwest, Northcentral, and Northeast regions of the United States, Northern and Central Europe and Canada.

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47. The maize plants, or parts thereof, of claim 21, further comprising one or more single gene conversions.

48. The single gene conversion(s) of claim 47, wherein the gene is a dominant allele.

49. The single gene conversion(s) of claim 47, wherein the gene is a recessive allele.

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